1/16 DIN Temperature, Process and Strain PID Controllers

iSeries

i16 Series

5 YEAR WARRANTY | CE | c UL us LISTED | FM APPROVED For Temp. Units

- Universal Inputs
- High Accuracy: 0.5°C (±0.9°F), 0.03% Reading
- Totally Programmable Color Displays (Visual Alarms)
- User-Friendly, Simple to Configure
- Free Software
- Full Autotune PID Control
- Embedded Ethernet Connectivity Optional
- RS232 and RS485 Serial Communications Optional
- Built-In Excitation
- 2 Control or Alarm Outputs Optional: DC Pulse, Solid State Relays, Mechanical Relays, Analog Voltage and Current
- Output 3: Isolated Analog Voltage and Current Optional
- NEMA 4 (IP65) Front Bezel
- Temperature Stability ±0.04°C/°C RTD and ±0.05°C/°C Thermocouple @ 25°C (77°F)
- Front Removable and Plug Connectors
- AC or DC Powered Units
- Ratiometric Mode for Strain Gages
- Programmable Digital Filter

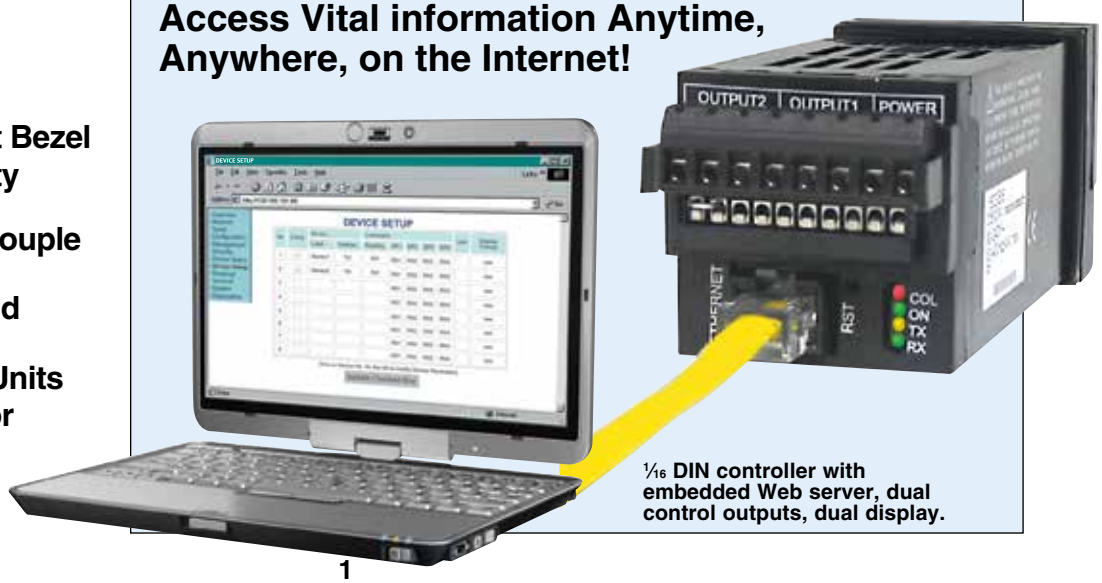
i16D33 shown larger than actual size.

i1633 shown larger than actual size.

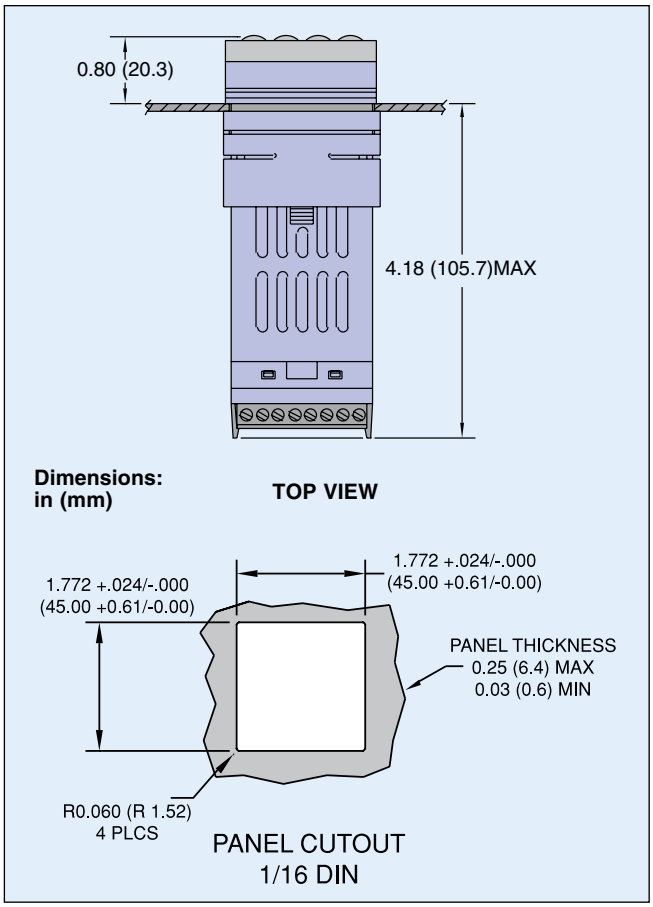
The NEWPORT® i16 is the popular 1/16 DIN size (48 mm²) controller. It is available with a single (model i16) or dual display (model i16D) that displays a setpoint along with the process value. The i16 display can be programmed to change color between **GREEN**, **AMBER**, and **RED** at any setpoint or alarm point. The i16 is the first 1/16 DIN controller with the option of both RS232 and RS485 in 1 instrument with both MODBUS® serial protocol and the straightforward Newport® ASCII protocol. And of course the i16 is the first 1/16 DIN controller that can connect directly to an Ethernet network and features an embedded Web server. Newport® provides free configuration and data acquisition software downloaded off of the Web.

The i16 enclosure has a NEMA 4 (IP65) rated front bezel. The electronics are removable from the front panel.

Access Vital information Anytime, Anywhere, on the Internet!



1/16 DIN controller with embedded Web server, dual control outputs, dual display.



Options

Ordering Suffix	Description
-AL	Limit alarm version (alarms only, no PID control)*2*3*7
-SM	Simplified menu (on/off control or alarms, no PID)*5
Networks Options	
-EIT	Ethernet with embedded Web server*1*6
-C24	Isolated RS232 and RS485/422, 300 to 19.2 Kb*2
-C4EIT	Ethernet with embedded Web server + isolated RS485/422 hub for up to 31 devices*1*2*6
Power Supply	
-DC	12 to 36 Vdc, 24 Vac*2*4
Factory Setup	
,FS	Factory setup and configuration
,FS(RTD-1N)	Customized "iS" Model for MIL-T-7990B nickel RTD input, 0 to 200°C (32 to 392°F)
,FS(RTD-2N)	Customized "iS" Model for MIL-T-7990B nickel RTD input, -40 to 300°C (-40 to 572°F)
Software (Requires Network Option)	
OPC-SERVER LICENSE	OPC server/driver software license

1 Ethernet options are available for the **i16D and **iS16D** controllers only.*

2 "-DC**", "**-C24**", and "**-C4EIT**" not available with excitation.*

3 Analog output (option 5) is not available with "-AL**" units or **i16A** models.*

4 20 to 36 Vdc for **i16D, **i16D-C4EIT**, **i16D-EIT** and **i16A***

5 "-SM**" option not available on **iS16** or **i16A** models.*

6 Ethernet options are not available for **i16A models.*

7 For **i16Axx-AL: One alarm and one analog retransmission.*

To Order *Visit newportUS.com/i16 for Pricing and Details*

Model No.	Output 1	Output 2
Single Display with 2 Control Outputs		
i1633	Relay	Relay
i1644	DC pulse	DC pulse
i1643	DC pulse	Relay
i1642	DC pulse	0.5 A SSR
i1622	0.5 A SSR	0.5 A SSR
i1623	0.5 A SSR	Relay
i1624	0.5 A SSR	DC pulse
i1653	Analog	Relay
i1654	Analog	DC pulse
i1652	Analog	0.5 A SSR
Dual Display with 2 Control Outputs		
i16D33	Relay	Relay
i16D44	DC pulse	DC pulse
i16D43	DC pulse	Relay
i16D42	DC pulse	0.5 A SSR
i16D22	0.5 A SSR	0.5 A SSR
i16D23	0.5 A SSR	Relay
i16D24	0.5 A SSR	DC pulse
i16D53	Analog	Relay
i16D54	Analog	DC pulse
i16D52	Analog	0.5 A SSR
Single Display Strain/Process Input with 2 Control Outputs		
iS1633	Relay	Relay
iS1644	DC pulse	DC pulse
iS1643	DC pulse	Relay
iS1642	DC pulse	0.5 A SSR
iS1622	0.5 A SSR	0.5 A SSR
iS1623	0.5 A SSR	Relay
iS1624	0.5 A SSR	DC pulse
iS1653	Analog	Relay
iS1654	Analog	DC pulse
iS1652	Analog	0.5 A SSR
Single Display with 2 Control Outputs and Isolated Analog Output		
i16A33	Relay	Relay
i16A24	0.5 A SSR	DC pulse
i16A42	DC pulse	0.5 A SSR
i16A43	DC pulse	Relay
Dual Display Strain/Process Input with 2 Control Outputs		
iS16D33	Relay	Relay
iS16D44	DC pulse	DC pulse
iS16D43	DC pulse	Relay
iS16D42	DC pulse	0.5 A SSR
iS16D22	0.5 A SSR	0.5 A SSR
iS16D23	0.5 A SSR	Relay
iS16D24	0.5 A SSR	DC pulse
iS16D53	Analog	Relay
iS16D54	Analog	DC pulse
iS16D52	Analog	0.5 A SSR

Comes with complete operator's manual.

***Ordering Examples: i1633,** temperature/process controller, output 1 relay, output 2 relay single display, 90 to 240 Vac power.*

***iS1643,** strain/process controller, output 1 DC pulse, output 2 relay, single display, 90 to 240 Vac power.*

iSeries Common Specifications (All i/8, i/16, i/32 DIN)

Universal Temperature and Process Input ("i" Models)

Accuracy: ±0.5°C temp; 0.03% rdg

Resolution: 1°/0.1°; 10 µV process

Temperature Stability:
- **RTD:** 0.04°C/°C
- **TC @ 25°C (77°F):** 0.05°C/°C
- **Cold Junction Compensation Process:** 50 ppm/°C

NMRR: 60 dB

CMRR: 120 dB

A/D Conversion: Dual slope

Reading Rate: 3 samples/s

Digital Filter: Programmable

Display: 4-digit 9-segment LED 10.2 mm (0.40"); i32, i16, i16D, i8DV 21 mm (0.83"); i8 10.2 mm (0.40") and 21 mm (0.83"); i8DH **RED**, **GREEN**, and **AMBER** programmable colors for process variable, setpoint and temperature units

Input Types: Thermocouple, RTD, analog voltage, analog current

Thermocouple Lead Resistance: 100 Ω max

Thermocouple Types (ITS 90): J, K, T, E, R, S, B, C, N, L (J DIN)

RTD Input (ITS 68): 100/500/1000 Ω Pt sensor, 2-, 3- or 4-wire; 0.00385 or 0.00392 curve

Voltage Input: 0 to 100 mV, 0 to 1V, 0 to 10 Vdc

Input Impedance: 10 MΩ for 100 mV 1 MΩ for 1 or 10 Vdc

Current Input: 0 to 20 mA (5 Ω load)

Configuration: Single-ended

Polarity: Unipolar

Step Response: 0.7 sec for 99.9%

Decimal Selection:
- **Temperature:** None, 0.1
- **Process:** None, 0.1, 0.01 or 0.001

Setpoint Adjustment: -1999 to 9999 counts

Span Adjustment: 0.001 to 9999 counts

Offset Adjustment: -1999 to 9999

Excitation (Not Included with Communication): 24 Vdc @ 25 mA (not available for low-power option)

Universal Strain and Process Input ("iS" Models)

Accuracy: 0.03% reading

Resolution: 10/1µV

Temperature Stability: 50 ppm/°C

NMRR: 60 dB

CMRR: 120 dB

A/D Conversion: Dual slope

Reading Rate: 3 samples/s

Digital Filter: Programmable

Input Types: Analog voltage and current

Voltage Input: 0 to 100 mVdc, -100 mVdc to 1 Vdc, 0 to 10 Vdc

Input Impedance: 10 MΩ for 100 mV; 1 MΩ for 1V or 10 Vdc

Current Input: 0 to 20 mA (5 Ω load)

Linearization Points: Up to 10

Configuration: Single-ended

Polarity: Unipolar

Step Response: 0.7 sec for 99.9%

Decimal Selection: None, 0.1, 0.01 or 0.001

Setpoint Adjustment: -1999 to 9999 counts

Span Adjustment: 0.001 to 9999 counts

Offset Adjustment: -1999 to 9999

Excitation (Optional In Place Of Communication): 5 Vdc @ 40 mA; 10 Vdc @ 60 mA

Control

Action: Reverse (heat) or direct (cool)

Modes: Time and amplitude proportional control; selectable manual or auto PID, proportional, proportional with integral, proportional with derivative and anti-reset Windup, and on/off

Rate: 0 to 399.9 s

Reset: 0 to 3999 s

Cycle Time: 1 to 199 s; set to 0 for on/off

Gain: 0.5 to 100% of span; setpoints 1 or 2

Damping: 0000 to 0008

Soak: 00.00 to 99.59 (HH:MM), or OFF

Ramp to Setpoint: 00.00 to 99.59 (HH:MM), or OFF

Auto Tune: Operator initiated from front panel

Control Output 1 and 2

Relay: 250 Vac or 30 Vdc @ 3 A (resistive load); configurable for on/off, PID and ramp and soak

Output 1: SPDT, can be configured as alarm 1 output

Output 2: SPDT, can be configured as alarm 2 output

SSR: 20 to 265 Vac @ 0.05 to 0.5 A (resistive load); continuous

DC Pulse: Non-isolated; 10 Vdc @ 20 mA

Analog Output (Output 1 Only): Non-isolated, proportional 0 to 10 Vdc or 0 to 20 mA; 500 Ω max

Output 3 Retransmission:
- **Isolated Analog Voltage and Current**
- **Current:** 10 V max @ 20 mA output
- **Voltage:** 20 mA max for 0 to 10 V output

Network and Communications

Ethernet: Standards compliance IEEE 802.3 10 Base-T

Supported Protocols: TCP/IP, ARP, HTTPGET

RS232/RS422/RS485: Selectable from menu; both ASCII and Modbus protocol selectable from menu; programmable 300 to 19.2 Kb; complete programmable setup capability; program to transmit current display, alarm status, min/max, actual measured input value and status

RS485: Addressable from 0 to 199
Connection: Screw terminals

Alarm 1 and 2 (Programmable)

Type: Same as output 1 and 2

Operation: High/low, above/below, band, latch/unlatch, normally open/normally closed and process/deviation; front panel configurations

Analog Output (Programmable): Non-isolated, retransmission 0 to 10 Vdc or 0 to 20 mA, 500 Ω max (output 1 only); accuracy is ±1% of FS when following conditions are satisfied: input is not scaled below 1% of input FS, analog output is not scaled below 3% of output FS

General

Power: 90 to 240 Vac ±10%, 50 to 400Hz*, 110 to 375 Vdc, equivalent voltage

Low Voltage Power Option: 24 Vac**, 12 to 36 Vdc for i/iS; 20 to 36 Vdc for dual display, ethernet, and isolated analog output from qualified safety approved source

Isolation

Power to Input/Output: 2300 Vac per 1 minute test

For Low Voltage Power Option: 1500 Vac per 1 minute test

Power to Relay/SSR Output: 2300 Vac per 1 minute test

Relay/SSR to Relay/SSR Output: 2300 Vac per 1 minute test

RS232/485 to Input/Output: 500 Vac per 1 minute test

Environmental Conditions:
- **All Models:** 0 to 55°C (32 to 131°F) 90% RH non-condensing
- **Dual Display Models:** 0 to 50°C (32 to 122°F), 90% RH non-condensing (for UL only)

Protection:
- **i/iS32, 16, 16D, 8C:** NEMA 4X/Type 4 (IP65) front bezel
- **i/iS8, 8DH, 8DV:** NEMA 1/Type 1 front bezel
- **Approvals:** UL, C-UL, CE per EN61010- 1:2001, FM (temperature units only)

Dimensions
- **i/8 Series:** 48 H x 96 W x 127 mm D (1.89 x 3.78 x 5")
- **i/16 Series:** 48 H x 48 W x 127 mm D (1.89 x 1.89 x 5")
- **i/32 Series:** 25.4 H x 48 W x 127 mm D (1.0 x 1.89 x 5")

Panel Cutout
- **i/8 Series:** 45 H x 92 mm W (1.772 x 3.622"), ⅛ DIN
- **i/16 Series:** 45 mm (1.772") square, ¼ DIN
- **i/32 Series:** 22.5 H x 45 mm W (0.886 x 1.772"), 1/32 DIN

Weight
- **i/8 Series:** 295 g (0.65 lb)
- **i/16 Series:** 159 g (0.35 lb)
- **i/32 Series:** 127 g (0.28 lb)

** No CE compliance above 60 Hz.*
*** Units can be powered safely with 24 Vac power, but no certification for CE/UL are claimed.*